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ARTICLE

Collaboration Exercises—The Lack of Collaborative Benefits

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Abstract The purpose of this article is to analyze what professional emergency personnel learn during collaboration exercises and the benefits of what they have learned. Observations ($n = 19$) and semistructured interviews ($n = 32$) were carried out in conjunction with major exercises held in Sweden (2007–2012). The results show that exercises tend to be based on their own logic, which differs from actual events. Exercise participants believe that they mainly learn single-track, parallel, and path-dependent behavior. The exercises do not facilitate the use of cross-boundary activities. This means that learning, as well as benefits from the exercises for actual events, is limited. The exercises would be more appropriate if those participating had the opportunity to identify weaknesses, try alternative ways, and engage in comprehensive organizational analyses at the conclusion of the exercises. Based on the results of the study, alternative models for collaboration exercises are suggested, with elements that would better develop collaboration and contribute to learning.

Keywords Ambulance · Collaboration exercises · Emergency personnel · Police · Rescue services · Sweden

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1 Introduction

Collaboration between professional emergency personnel is crucial in dealing with accidents, crises, and disasters (Kapucu 2008; Powley and Nissen 2012; Christensen et al. 2013; Clarke 2013). This is especially true for larger events when resources are scarce, but also for smaller events when those who first arrive at the scene are not trained to handle the specific situation (Scholtens 2008). In most countries, the police, rescue services, and ambulance are the organizations that deal with a large number of emergency responses on a daily basis and practice collaboration regularly (Borodzicz and van Haperen 2002; Grote et al. 2009; Kapucu et al. 2010; Lateef 2010; Berlin and Carlström 2011; Van Wart and Kapucu 2011; Andersson et al. 2014). Exercises prepare them to be able to handle accidents, crises, and catastrophes in an optimal manner (McConnell and Drennan 2006; Kapucu et al. 2010; Brattberg 2012; Berlin and Carlström 2015).

In Sweden, personnel from police, rescue services, and ambulance gather regularly to practice. The exercises take place on the international, national, regional, and local level. Both management and operational personnel are involved in the planning, implementation, and follow-up of the exercises (Ingemarsdotter and Trané 2013). The exercises are arranged, for example, in the form of desktop exercises with simulations of a particular sequence of events, or as full-scale exercises in a nearby field, where personnel gather for a day and conduct practical sessions based on a simulated event.

Full-scale exercises are conducted regularly in order to strengthen the community's ability to deal with accidents, crises, and catastrophes. The aim is to allow professional emergency personnel to acquire an increased ability to enlist the help of each other on the operational level, to

cross organizational boundaries, and be prepared to act in an integrated manner (Marincioni and Fraboni 2012; Kim 2013). There is a belief that if time and resources are spent on the exercises, the organizations will become better prepared to deal with difficult situations than if no exercises are conducted (Sommer et al. 2013). The effects of the exercises, however, have been described as relatively difficult to identify (Sinclair et al. 2012). One reason for this has been that the scenarios have proven to be either too complex or too simple to contribute to any useful learning (Boin et al. 2004; Smith 2004; Crichton et al. 2009). Although the exercises are considered essential for emergency preparedness, research on full-scale exercises between police, rescue services, and ambulance has been relatively limited (Perry 2004; Rykkja 2010). This also applies to what benefits such exercises may have for the actions at actual events (Quarantelli 1988; Perry and Lindell 2003; GNYHA 2005). The purpose of this article, therefore, is to analyze what professional emergency personnel learn from collaboration exercises and the benefits of what they have learned.

2 Background

Different exercises have different aims. Here, exercise types with three aims are identified (Table 1). "Strategic exercises" (model 1) aim to simulate an event to examine what outcomes different interventions may have. Thus, the primary aim of such exercises is not the teaching of personnel at the operational level in the respective organization. Rather, the idea of strategic exercises is to analyze the outcomes of different strategies under different conditions (Babu et al. 1997). "Drill exercises" (model 2), according to Berlin and Carlström (2011), aim to strengthen individuals' knowledge in the practice of their profession. Drills repeat key elements such as the police's use of weapons, rescue services' fire-fighting techniques, and ambulance personnel's life-saving efforts. Together with colleagues, professional methods for the quick handling of common and recurring tasks are practiced. "Collaboration exercises" (model 3) aim to bring different organizations together to integrate actions across organizational boundaries. Such exercises challenge the ability to use common global resources in an optimal way (Berlin and Carlström 2011). In Sweden, such exercises are called collaboration exercises because they aim to practice collaboration across organizational boundaries (Berlin and Carlström 2008). A collaboration exercise shows the organizations' abilities to prioritize, overlap, and complement each other in a resource-intensive effort. It is this last exercise model that is the focus of this study.

Table 1 Exercise types, learning, and benefit

Exercise type	Learning	Benefit
Strategic exercise	Knowledge of the effects	Concepts
Drill	Copying	Routines
	Repetitive skills	
Collaboration exercise	Flexibility	Cross-organization behavior
	Resource optimization	

Sources Babu et al. (1997), Berlin and Carlström (2008, 2011)

Previous studies of collaboration exercises have focused on the implementation, significance, and function of the exercises (Mitroff and Anagnos 2001; Fink 2002; Boin et al. 2005; Coombs 2007; Drennan and McConnell 2007). There is a widespread assumption that collaboration exercises prepare individuals, rescue teams, and entire agencies to become better at managing crises (Ingemarsdotter and Trané 2013). However, a serious problem is the difficulty of creating solutions for managing events that involve multiorganizational responsibilities (Donahue and Tuohy 2006; Moats et al. 2008). Organizations tend to work in parallel rather than cooperatively and often have difficulty understanding each others' concepts, particularly, organizational models, action logics, agendas, legislations, and hierarchical levels (Peterson and Perry 1999; Perry 2004; Berlin and Carlström 2008; Lee et al. 2009).

Getting emergency personnel to take the initiative to pull together across organizational boundaries is one of the key difficulties in a collaboration exercise. This is brought to a head in situations of resource scarcity or resource asymmetry. At events where not all the organizations are represented, the ability to perform the tasks of others is tested (Berlin and Carlström 2008). While collaboration seems to be the goal, in reality, drills have been the focus of exercises (Berlin and Carlström 2013). Each organization tends to focus on its own priorities and specific tasks instead of seeing the big picture (Smith and Elliott 2007). In addition, the participants seem happy to do tasks that they are used to doing but are passive when unknown tasks need to be performed (Berlin and Carlström 2008).

One reason that the focus remains within the individual organization during exercises, which has been identified, is that the scenarios are too large and complex (Berlin and Carlström 2013). Complex scenarios make it difficult to evaluate how things fit together (Babu et al. 1997). With misplaced, overzealous ambition, exercise leaders can expose organizations to challenges far beyond the ability of the participants. In their haste, they run around each other and construct unrealistic chains of events. Such exercises can have completely opposite effects to the ones intended and do not lead to learning, increased self-awareness, or

development of the participants' roles (Loveluck 1994; Borodzicz 1997; Lagadec 1997; Borodzicz and van Haperen 2002; Powley and Nissen 2012).

A disadvantage of exercises, in comparison with actual events, is that they are fictitious and constructed; thus, they can never fully address phenomena that arise at the actual events. Furthermore, the array of accident events that can befall society are endless; this means that all possible scenarios can hardly be practiced (Rosenthal 2003; McLennan et al. 2006; Lalonde 2007; Roux-Dufort 2007; Lalonde and Roux-Dufort 2013).

Exercises have a tendency to exhibit constructed, artificial patterns that would not have occurred during an actual event. Knowing that "it is not real" can lead to behaviors that deviate from what happens at an actual event, which prevents participants from gaining experiences that may be used at an actual event (Berlin and Carlström 2008). There have been reports of so-called "infallibility behavior," where participants show off their best sides in order to make an impression on the other participants, managers, and external visitors (Boin et al. 2005).

Smith (2004) argues that when there is a learning exercise culture, the participants are keen to reveal their own weaknesses. In such circumstances, there is an assumption that mistakes will happen and that exercises can reveal these shortcomings. According to Gredler (1992), effective exercises are comprehensible and provide space for reflection, which results in new thinking patterns. Gredler believes that the activities that follow exercises are just as important as the exercises themselves. Moynihan (2009) has shown that learning is particularly effective when professionals learn from each other, through open forums where participants from different organizations come together for discussion.

Ineffective exercises repeat the same mistakes exercise after exercise, the same sources of irritation are recorded, similar friction is experienced and even though they are highlighted, the problem is replayed again at the next exercise. Such exercises do not contribute effectively to the learning that is appropriate for the activities at actual events (Boin et al. 2005). Consequently, developing instructive, appropriate, and effective exercises is a difficult art for practice management (Alexander 2013), particularly, if the aim is to enhance preparedness to collectively handle critical events (Lalonde 2004; Lalonde and Roux-Dufort 2013).

Learning is one of the benefits of exercises (Smith and Elliott 2007). Gredler (1992) points out that a beneficial exercise results in new patterns of thought that are considered useful in actual events. Thus, learning stands for development and change. In contrast, police, rescue services, and ambulance are stable, reliable, predictable, rational, and repetitive organizations (Perrow 1984; Frederickson and LaPorte 2002; Boin et al. 2005).

Rutherford (1984) used the concept of path-dependency to illustrate a collectively accepted opinion and conventional stable behavior. Paths can prevail for a long time. This is underscored by classical examples of conservative technologies (Arthur 1988a, b; David 1985, 2001). By reinforcing processes, alternatives are avoided, and by a state of collective conservatism, renewal is resisted (Rutherford 1984). This is the hypothetical core of path narrowing. A path narrows when options for change are turned down. This state of inertia is found in publicly financed organizations that depend on long-established traditions. Such paths have however proven to be too narrow (Carlström 2012). Van Nieuwaal (2006, 2011) defines narrowing paths as having less room for maneuvers. Even though a path can be reinforced, it could still end up narrowing. However, the narrowing process does eventually lead to the creation of new paths (Garud and Karnøe 2001). The new paths are preceded by a deinstitutionalization process of dissolution of ideas and behaviors (Hinings and Malhotra 2008).

In contrast to drills, collaboration exercises require dynamics and the ability to change (Berlin and Carlström 2008). They require the ability to switch strategies depending on the situation that exists and being open to different options (Van Wart and Kapucu 2011; Sommer and Njå 2012). In a crisis context, change is about, for example, finding new ways to handle a situation by customizing one's efforts in collaboration with others. The challenge is to achieve the quickest and best results (Grote et al. 2009; Nemeth et al. 2011).

Such change is not localized. It affects the majority of employees in an organization (Blumenthal and Haspeslagh 1994). Haydu (1998) defines institutional change as the start of a new behavior, which then spreads through a community. Old models are abandoned when they no longer serve the organization (Bush 1987).

Institutional change processes are the framework for institutional learning. Institutional learning occurs on the collective level as opposed to that in the learning theories dealing with individual learning (Stein 1997). Institutions are formed by reciprocity between individuals who, when it is favorable, change behaviors by creating common understandings and behaviors (Knudsen 2002).

An institution is based on shared values and with institutional learning, individuals adapt to shared values. Institutional learning requires adaptation and an ability to understand the prevailing conventions that exist in a collective (Appelbaum and Wohl 2000). Already established institutions are sluggish; they continue to exist and can withstand influences from the environment for a long time. In such circumstances, longstanding traditions and single-

track behaviors dominate (Carlström 2012). Johansson et al. (2013) suggest the importance of combining change-willingness and stability in order to be able to implement something new and make it sustainable. This stresses the need to support flexibility and trust, as well as stability, planning, and repetitive behavior. Alharbi et al. (2014) suggest that organizations that can balance opposing characteristics seem to have the best chance to successfully implement necessary change and sustain it. This is in accordance with Quinn (1988), who asserts that effective organizations present contradictory characteristics.

Popular concepts such as collaboration can be decoupled from actual behavior. In the exercise context, this means that the ambition of learning does not have any effects on the behavior at the actual events, and deep-rooted habits prevent a profound change from taking place (Corbacioglu and Kapucu 2006). In-depth learning, however, can change values to the point that the newly learned behaviors are applied to relevant situations (Stein 1997). According to Klabbers (1999), the deeper types of learning, also called second-order learning, consist not only of abstractions and concepts, but also have elements of intensive collaboration with others (Deverell 2012; Thompson 2012).

Such learning puts the individual in a social context. Within the collective of individuals, new thinking and new methods are developed, which can also be applicable in different situations. Stein (1997) calls the phenomenon an institutional learning where routines, rules, and models are changing and have a great influence on the organization (Stein 1997; Torres and Preskill 2001).

3 Method

The data for this study were collected over 6 years (2007–2012). The study's primary focus is the overall recurrent features of collaboration exercises. The idea is to follow the general repeated patterns of behavior over time. The study's data come from Sweden, where the police, rescue services, and ambulance are legally equal. This means that an officer cannot give orders to personnel other than within his/her own organization. This approach challenges organizations when it comes to collaboration.

From a researcher's perspective, the advantage of studying exercises as they progress is that they can be followed directly as it happens. The researcher can follow and document the participants' behavior from the arrival of the first rescue unit until the situation is normalized and the exercise has been concluded (Scott 1994; Rolfe et al. 1998; Borodzicz and van Haperen 2002; Lateef 2010; Kim 2013).

Previous studies have largely been based on a retrospective approach to capture relevant data (Palm and Ramsell 2007). To gather data after a real event, however, is difficult. The events can be viewed as vague hindsight reconstructions. Those involved often have difficulty remembering exactly what happened, in what order things were done, and who did what, how, and when (Sikström 2002).

Data were collected through semistructured interviews, accompanying observations, and document studies. During data collection, we had access to the entire exercise area of a given exercise. After an exercise, we also had the opportunity to conduct interviews with the exercise participants and exercise leaders. We were able to capture their understanding of the exercises' learning effects and how these influenced them in their daily work. Based on the observations, questions were asked about the participants' experiences and reflections.

The empirical data for this study were collected in western, eastern, and southern Sweden. The exercises were conducted in Västra Götaland, Stockholm, and Skåne. Exercise leaders from each organization were responsible for inviting personnel from their own organizations to participate. The exercises were designed on the basis of an accident's three phases: initial phase (call and arrival), practical phase (work at the accident site), and a normalization phase (summation, packing up, and completion). Exercise participants were expected to act as they would have in a similar actual situation. They made the same contacts, requested the same resources, and took the same actions. The exercises were full-scale, with 50–300 participants, and lasted from 4 to 48 h. The total dataset consists of 96 h of observation time. The observation time was about 5 h on average for each exercise (Table 2).

Data collection through observations is a form of ethnographic field research (Hammersley and Atkinson 2005; Wolcott 2008; Fetterman 2010). In this project, observation followed the work on collaboration exercises at close range (Jørgensen 1989; Watson 2011). To be present at the area where the exercises were performed, we accompanied one of the practicing organizations (police, rescue services, or ambulance) to the exercise site. As observers, we had an impartial, uninvolved, and passive stance. In several cases, we were both on site and were able to capture various parallel events from several angles. The observations took place where the participants gathered, such as the command center, at the mock accident scene, and at the various assembly points. To document the exercises, we used a notepad, digital camera, and voice recorder.

The observation method meant that the raw data could be collected, even though the event itself was at times relatively fast (Burgess 1991). The analysis was carried out in three steps. First, we selected the relevant images within each exercise. In the second step, we coded the images. Then we sorted and analyzed all the observations as a

Table 2 Collaboration exercises in Sweden observed and analyzed for the study

No.	Year	Scenario	Observation time
1.	2007	Fire—elementary school	310 min
2.	2007	Traffic accident between bus and car	290 min
3.	2007	Fire—car ferry	250 min
4.	2007	Fire—high school	270 min
5.	2008	Fire—prison	330 min
6.	2008	Fire—car tunnel	240 min
7.	2008	Airplane crash	330 min
8.	2008	Fire—car ferry	280 min
9.	2009	Fire—large passenger ferry	290 min
10.	2009	Fire—elementary school	250 min
11.	2009	Threat of suicide bomb	300 min
12.	2009	Fire—defense headquarters	310 min
13.	2010	Train collision	330 min
14.	2010	Car accident pileup	260 min
15.	2011	Fire—nuclear power plant	360 min
16.	2011	Accident between bus and car	320 min
17.	2011	Fire—transport ferry	320 min
18.	2011	Fire—military naval base	360 min
19.	2012	Train collision at Öresund Bridge	360 min
		Total:	**5,760 min (96 h)**

whole (Miles and Huberman 1984/1994; Burgess 1991; Pope and Mays 2000).

After the exercises, interviews were conducted with the exercise leaders and personnel. A total of 32 semistructured interviews were conducted with police officers, rescue services, and ambulance personnel (Kvale 1996). The total interview time was 23 h. We had the opportunity to ask detailed questions about the behaviors we were able to follow during the observations (Mason 1996; Golden-Biddle and Locke 1997).

The interview questions related to exercise effects, the perception of mistakes during the exercise, difficulty with exercises, learning, and the effects that the exercise had on regular work. They were used to study and verify the various progressions and how the collaboration exercises were understood. The interviews were conducted in person at each interviewee's workplace. All the interviews were recorded and transcribed. In order to support certain key statements and get an understanding of some critical elements, the interviews and observations were also supplemented with document studies. They were mainly about descriptions of each exercise and subsequent evaluations.

4 Empirical Data

In Sweden, full-scale collaboration exercises are conducted periodically to test society's catastrophe and crisis preparedness. The exercises are often designed as all-day activities with a comprehensive scenario, mock victims, exercise leaders, vehicles, radio traffic, and practicing personnel. A typical collaboration exercise begins with the organizations gathering together to review the exercise conditions, assembly areas, plan of attack, channels of communication, and safety instructions. Upon completion, the personnel prepare by gathering equipment, moving vehicles to assembly areas, synchronizing exercise channels, and waiting for the alarm. When the call is communicated, each organization goes to the accident site and starts to act. The process from start to finish can last 4–6 h. In some cases, the exercise leaders set a limit for the length of the exercise. After the exercise, the work materials are collected together quickly and participants are treated to simple refreshments. During this period, all participants are gathered, including the mock victims, for a brief review of the exercise. Thereafter, the exercise leaders thank the mock victims and participating organizations for a successful and informative exercise. The exercise is concluded, and the participants express their gratitude and return to their respective stations. Several weeks later, the exercise leaders meet to discuss possible results and what needs to be improved.

4.1 Collaboration

Collaboration is addressed in the following subheadings: complex scenarios, repetitive behaviors, restricted organizations, sequential behavior, and parallel behavior.

4.1.1 Complex Scenarios

Extensive and complex scenarios dominated the exercises. In several cases, the exercise leaders wanted to add an advanced chain of events to a single exercise, challenging a path-dependent behavior. One example of this approach was the exercise "fire at nuclear power plant" (Exercise 15, Table 2). The exercise combined severe weather conditions with technical breakdowns, a traffic accident in the security area, a fire in a building, and finally, a reactor accident involving a radioactive release due to a malfunctioning backup cooling system. Parts of this chain of events were meant to confuse and distract from the events that were most essential. The events were also not related to each other.

Both the exercise leaders and the participants had difficulty practicing collaboration and using the opportunity to practice synchronous operation.

> Exercises often go off the tracks and become too big.
> (Paramedic)

In order to create structure, some exercise leaders went in and coached the key players in the exercise so that they would not lose track of the event's development. Exercise leaders became a kind of "exercise prompter" and steered the course of the event so that it was consistent with their planning. Any shortcomings in the exercise were prompted with various ad hoc solutions.

> … in such a major exercise in which there are so many participants, the exercise leaders go and give small hints and try to control it, so it doesn't become completely crazy.
> (Chief, Fireman)

The exercise's complexity, the number of organizations, and the arrangements also made it harder to explain the idea and purpose of the exercise in an easy and comprehensible manner. Exercise leaders had no clear division of responsibilities among them, which affected the logistics, as well as who should do what in connection with the exercise. In the "fire in the prison" exercise (Exercise 5, Table 2), confusion arose because of the ambiguities between the exercise leaders and the prison staff. Police, rescue services, and ambulance had difficulty getting access to the prison area because the prison security staff followed normal procedures for entry and exit. The high safety measures at the prison made it difficult for those practicing to move smoothly inside the prison area. The participating personnel demobilized guns, batons, and pepper spray, and found it difficult to act as they would at an actual event inside the prison area. The ambulance personnel were not admitted inside and instead stood waiting outside the prison's security gates.

Complex and difficult to manage scenarios and lengthy exercise sessions contributed to the exercise becoming passive. Participants tended to wait for each other in the hope that someone else would take the initiative. They chose not to mingle with the participants from the other organizations. If the aim was to achieve collaboration by increasing the complexity, it had the opposite effect. Participants avoided collaboration and isolated themselves by being with their own colleagues.

The complexity also meant that there could be unnecessary waiting times, for example, to wait for the call, to drive to the accident site, to take action at the accident site, to pack up, to get a snack, and to go home. The exercise got stuck and the development of the event did not go smoothly. The mock victims had to wait a long time before they were taken care of, in some cases getting exposed to the cold as a result. A large part of the personnel never got the opportunity to practice synchronous collaboration. In the "fire in the car tunnel" exercise (Exercise 6, Table 2), there was such a long waiting time that a dozen people never got to participate in the exercise. Both the police and the ambulance personnel stood a distance away from the accident site and listened to the radio traffic. A growing dissatisfaction arose at the assembly area; small groups of personnel stood idly in the biting wind at a parking lot and talked about how useless it felt to not participate actively in the exercise. In the "airplane crash" exercise (Exercise 7, Table 2), a rumor spread about whether there was a bomber on board a crashed plane (Fig. 1).

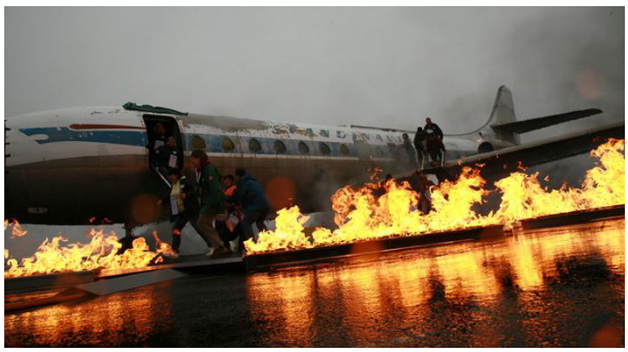

Fig. 1 Evacuation from aircraft (Exercise 7). Photograph by A. Hall, 9 September 2008

The plane was on fire and there were a large number of casualties and serious injuries on board. The rumor of a terrorist attack meant that the police cordoned off the area for 40 min to search for the perpetrator. Despite the severity of the injuries, the mock victims were lined up on the runway to be searched and interrogated. In the end, the police intervention was stopped because the mock victims were not dressed for the cold weather and began to show signs of exposure. The complexity of the event and the 10 organizations involved meant that the cross-boundary collaboration moments were difficult to attain. The delay affected the continuation of the exercise; efforts ended up being brief and were conducted dutifully without much enthusiasm.

4.1.2 Repetitive Behaviors and Restricted Organizations

One feature of the exercises was that those practicing had to repeat simple steps that they were already capable of doing and had practiced in their own organization. For example, the rescue services personnel carried out the injured throughout the exercise. In the "fire in the high school" and "fire in the elementary school" exercises (Exercises 4 and 10, Table 2), firemen wearing smoke helmets evacuated smoke-injured young people for most of the exercise, a task that they were well acquainted with from previous experience (Fig. 2). The same applied to

Fig. 2 Firefighters carry injured (Exercise 4). Photograph by J. Berlin, 3 October 2007

ambulance personnel. In 15 of the exercises, the ambulance personnel devoted themselves mainly to tasks that were included in their regular practice, that is, to assess, immobilize, and stabilize patients and then load and transport them to the hospital. In several of the exercises, some 20 individuals from the ambulance personnel worked only on these tasks. Other personnel, especially police officers, were engaged in only a few of these tasks. The repetitive elements were prioritized over collaboration elements. Police officers often found themselves at the barrier tape and watched the event from a distance, recorded data, took witness statements, and maintained order. These elements were repeated over and over again until the conclusion of the exercise. It meant that the exercise time was filled with simple tasks, and the number of synchronous collaboration elements was minimized. Communication between those practicing was flawed. The tasks were performed side-by-side without mutual interaction or coordination.

In the "fire on a car ferry" exercise (Exercise 3, Table 2), resources were needed to transport the injured. Because of an inadequate radio communication, most of the police units and some of the ambulance services had difficulties locating the ferry.

The communication that occurred was mostly within each organization. Several police units had placed themselves at checkpoints in remote areas on the beach, far from the car ferry. Some police officers boarded the ferry using a police boat but did not pay any attention to the injured. They passively looked on as understaffed ambulance personnel worked to attend to, carry, and transport the injured. Subsequent interviews revealed that the police personnel felt unsure of working with the injured individuals. In an interview, a police officer explained the reason for the hesitation to get involved:

> We are not used to working with injured individuals. It feels like carrying or handling the injured improperly could worsen the situation.
>
> (Police)

In the "fire in the elementary school" exercise (Exercise 10, Table 2), police were instructed to register injured students. A large number of police officers were allocated throughout the exercise to record the names and addresses of the mock victims on preprinted forms. When the exercise was over, the forms were collected and discarded. A feeling of discontent spread among the police personnel who felt that the exercise was rather pointless. Their collaboration with the other organizations had been limited during the exercise. The task they kept busy with—filling out personal information on claim forms—had nothing to do with collaboration.

4.1.3 Sequential and Parallel Behavior

The collaboration that occurred in all observed exercises was mainly limited to sequential and parallel collaboration, which essentially meant that each organization performed its tasks, one at a time, or worked in parallel side-by-side with the other organizations. Synchronous or overlapping seamless collaboration between organizations could occur for short periods. It seemed spontaneous when working on the extrication of victims from wrecked cars, evacuation of victims from a bus, or evacuation of the wounded from a burning building. This meant that the advanced collaboration elements were practiced relatively sparsely during the exercises.

> We try to work as it is stated in our plans. The rescue leader does his thing, the police do theirs, and ambulance personnel do their tasks. Then we try to resolve issues individually.
>
> (Ambulance Nurse)

It proved difficult to break down organizational barriers and collaborate with people the exercise participants did not know and were not used to working with. In the "fire at the defense headquarters" exercise (Exercise 12, Table 2), one police officer had difficulty getting help to carry a person who had been injured due to the smoke from the building. Personnel from the ambulance and rescue services did not see it as their duty to help the police officer even though they were just a few meters away. The police officer, instead, got some unexpected help from a civilian observer who came and helped to carry the smoke-injured victim to the medical care area.

In the "fire on a car ferry" exercise (Exercise 3, Table 2), the engine room on a car ferry had caught fire while out in the middle of the lake. The rescue services,

Fig. 3 Work at the collection point for the injured (Exercise 8). Photograph by J. Berlin, 16 October 2008

police, and ambulance were supposed to rescue the injured, exhausted, and shocked victims using boats and transporting them to the medical assembly areas located on land. The police boat kept its distance during the rescue work and did not rescue the smoke-injured people from the car ferry. Rescue service and ambulance boats did not coordinate the work among themselves. They did not know what the others were doing or which part of the car ferry was supposed to be taken care of. Organizations worked sequentially and in parallel but without common coordination.

In the "fire at the military naval base" exercise (Exercise 18, Table 2), an arson fire occurred in connection with a school visit at a military naval base. Efforts to rescue the injured were delayed significantly because the ambulance personnel did not go down into the underground rock caverns until the police had surrounded, blocked off, and secured the area. The area in the rock caverns was quite large, which made it impossible for the police to secure the area within a short time. The fact that the organizations misunderstood each other meant that the exercise leaders finally had to order the ambulance personnel to begin the crucial life-saving medical work down in the rock cavern, even though the area was not cordoned off and secured. The police conducted the subsequent evaluation internally. The other participants did not get any insight into how the other organizations had arrived at different decisions during the exercise.

In the "fire on car ferry" exercise (Exercise 8, Table 2), some 20 injured persons were evacuated (Fig. 3). Already at the beginning of the exercise, the organizations split up and began repetitively to perform their own tasks, without evaluating the overall needs. This meant that the exercise was out of step and the quality of the efforts varied because some periods were understaffed. The reason was that those practicing did not keep track of the overall picture at critical moments.

In the studied exercises, the exercise leaders generally considered collaboration as something that was "given" and "well-proven," while in reality it was not "given" how organizations should act together during the exercise. To handle the situation, the participants, for the most part, worked sequentially and in parallel. The synchronous, cross-boundary operations the exercises were intended to rehearse, encourage, and reinforce were rarely in evidence.

4.2 Lessons Learned

The section Lessons Learned refers to the data collected and asks the question "What did you learn at the exercise?"

4.2.1 What Did You Learn at the Exercise?

During subsequent interviews, the participants found it difficult to articulate clearly what they learned during the exercise. Some focused on a variety of practical features, others highlighted personal reflections, while a large group did not perceive that they had learned anything at all. One interviewee described it this way:

> What did you learn about collaboration?
>
> Well, actually nothing, you can say. I sound very negative, but I did nothing. I stood there and sent people to an assembly area, I mean, that's nothing. It taught me nothing.
>
> (Ambulance Nurse)

Some chose to view the fact that the exercises did not focus on collaboration as an experience. They perceived that they could still learn something from the exercise that could be applied and used in a real event. Therefore, many of the participants thought it was important to make mistakes, try things on their own during the exercise, and test alternative strategies.

> … it's really through mistakes that one learns (…)… if you end up in an exercise scenario where things do not work well, you can use that at an actual event, where you can change the things that did not work.
>
> (Ambulance Nurse)

> … regardless of how it goes, you always learn something in the exercises. (…) It is also an experience of collaboration exercises that it does not really matter how it goes, you always learn something. That's worth something in itself.
>
> (Chief, Fireman)

> I think it is important that the exercises are designed in such a way that you can really try different things that could fail and then compare different strategies.
>
> (Ambulance Nurse)

One difficulty was that very little time was allocated following the exercises to discuss experiences and reflections in connection with the exercises. When the exercises were concluded, the material had to be packed up and a meal had to be served. In most cases, there was not much time left for collective reflections.

> There wasn't much time for collaboration in this exercise. A longer discussion might have been preferable. Then we would also have learned more about how the others work and how to collaborate better.
>
> (Fireman)

Long, time-consuming exercises made it difficult to have enough time for monitoring and evaluating.

> I think that what happens afterward is almost more important than the exercise itself, to tie things up, and it was short, I think, and stressful. It's always the same when you have exercises, there isn't enough time. But it must be planned so that you have plenty of time to assess and learn from it.
>
> (Police)

There was a need to plan the exercises so that those practicing did not run out of time at the end. Respondents felt that more emphasis needed to be placed on a concluding evaluation with discussion, feedback, and reflection.

4.3 Benefit

The section Benefit is based on questions relating to the perceived value or usefulness of the collaboration exercises in actual situations.

4.3.1 Value of Collaboration Exercises in Actual Situations

There were different views on the extent to which those practicing had gained some benefit from the collaboration exercise, which could be used in actual situations. The responses can be grouped into two categories. There was a small group who felt that they did not gain any benefits from the exercise and a larger group who believed that they had gained limited benefits from the exercise, which could be useful in actual accident work. Those who found it difficult to relate the exercise to their daily work felt that the situations that were practiced were too broadly constructed and cumbersome to be recognized as being related to the regular work.

> Do you use what you learn in the exercises in actual situations?
>
> No, I cannot think of anything that I've used actually.
>
> (Police)

> It's so seldom, or almost never, that one or that I've been through this kind of complex event with so many injured. Then, the incident seemed imaginary. It makes it hard to bring this to your daily work.
>
> (Fireman)

> Unfortunately, it's a little bad with the lessons learned, I would say. It seems that you forget what you've learned when it happens for real. (…) In principle, we almost never do this with markings and logbooks in reality. We never have this claims experience. I have worked since 1994, and have never been part of that.
>
> (Exercise Leader, Police)

> I felt like I have learned nothing new about this here. So there's not much I can take with me.
>
> (Ambulance Nurse)

The reason that the exercises did not have a stronger impact on the actual accident work was due to the extent of the exercises, lack of realism, and the participants' difficulty to empathize with and relate to the exercise scenario. A large proportion of respondents felt that they could relate some parts of the exercises to real situations. In particular, when new strategies were tried, they turned out to work in actual situations. One interviewee expressed it like this:

> Finally… at an exercise, then I did this and this and it actually worked well. I am testing it and also using it now in a critical situation.
>
> (Ambulance Paramedic)

Through the exercises, those practicing could test their stress tolerance. Even if the scenarios were so confusing that things were difficult to evaluate, the participants could test their ability to stay calm and think clearly. Many of them saw this as beneficial for actual events.

> At the same time, I want to state that these exercises, they help in that in real-life situations, they keep you a little bit, a little calmer, and you start thinking in a different way already on the way.
>
> (Ambulance Paramedic)

Although it was difficult to specify exactly what from an exercise could be beneficial in an actual event, several respondents felt that the exercise contributed to an unconscious experience, which was activated during actual events. The experience of the exercise remained with them and affected the practical work in the field. This was a good reason for having these exercises regularly and for the participants who met at actual events to participate in the collaboration exercises.

Table 3 The most important results divided into collaboration, learning, and benefit

A. Collaboration	B. Learning	C. Benefit
Appeared as	**Appeared as**	**Appeared when**
Sequential and parallel	Opportunities to make mistakes	Innovative approaches were tested
Synchronous for short periods	Ability to test different strategies	Realistic scenarios were used
	Comparisons	Application of systematic approaches and guidelines
	Discussions	
Hindered by	**Hindered by**	**Hindered by**
Internal organizational focus	Lack of structure	Unrealistic scenarios
Advanced scenarios	No common reflection	Constructed scenarios
Passivity	Few high-level organizational discussions	Complex organization
Long waits	Exercise leaders acting like teleprompters	Difficult to transfer experience to colleagues
Focus on simple elements (drill)		

> Yes, absolutely. Everything we practice, you put in a backpack. You put it somewhere in the back of your head. If you end up in a similar situation again, you remember what you did in the exercise. All exercises give you experience.
>
> (Fireman)

A limitation in terms of the benefits was that it was difficult to transfer the experiences of those practicing to other colleagues in the same organization who did not participate in the exercise. The respondents expressed that there was a transmission problem within the organization that was difficult to come to terms with.

> It's very difficult to take the experiences from one exercise and try to share them with those who were not there.
>
> (Chief, Fireman)

Often, the exercise evaluations came long after the exercises had been conducted and the colleagues did not read them. A few people talked about the lessons learned from these exercises. When those practicing had returned home, it was as if the exercises had never occurred. This meant that the exercises could be beneficial to those practicing, but not for those colleagues who did not participate.

Another manifestation of the difficulty with the exercises was to get the experienced officers of each organization to sign up for the collaboration exercises. In many cases, they did not want to participate. They switched their shift or took sick leave to avoid the exercise.

> The regular officers do not want to go. They are afraid to appear weak. (…) In the past, I checked them off on a list. Then they switched their shift at the last minute with someone else.
>
> (Exercise Leader, Police)

This tended to result in a certain contagious effect when even younger employees were reluctant to participate in the exercises.

5 Analysis

The exercises studied were intended to strengthen the ability to prioritize, overlap, and complement each other at events that required efforts from multiple organizations at the same time. The focus of the exercises was thus collaboration, and the learning and the benefits that were expected by those practicing were primarily the ability to work across boundaries and use common resources as optimally as possible.

However, the results from the exercises showed that the collaboration elements were relatively limited. Participation mainly consisted of sequential and parallel behavior, that is, each organization performed its tasks, one at a time, or side-by-side. Synchronous or seamless collaboration occurred only briefly and was hindered because the exercises were unstructured, had messy scenarios, and complicated chains of events. In addition, collaboration was limited by involuntary inactivity, long waiting periods, and repetition of already known elements.

Learning was dependent on the possibilities to collaborate during the exercises. It benefited from opportunities to test different strategies and making room for discussion. It was hampered by the police, ambulance, and rescue services prioritizing the focus within their own organization and by the lack of exercises that allowed for common reflection (Alexander 2013).

The benefits from the exercises were that innovative approaches were tested, stress tolerance was tested, and routines were carried out. However, the benefits were limited by unrealistic scenarios, constructed layout,

cumbersome organization, and difficulties in transferring one's experiences to colleagues who did not participate in the exercises (Table 3).

When it comes to learning, Stein (1997) asserts that there is a difference between the immediate learning or imitation of different behaviors and a deeper learning that fundamentally changes the behavior of the person practicing. This argument highlights the difficulty that arises when exercise leaders are too prescriptive during an exercise. The effect can be that those practicing do not see the consequence of a particular strategy, which prevents learning. Such an approach can also contribute to a procedural approach in which the exercise leaders and the participants strive to get to a "flawless" exemplary exercise (Boin et al. 2005). The respondents questioned the purpose of the exercises and thought it was meaningless and time-consuming to act in a sequential and parallel way during a collaboration exercise. They requested joint discussions at the conclusion of the exercises. They also wanted more opportunities to gain insights into the collaborating organizations, to openly discuss the strengths and weaknesses, and to refine and develop the approaches in dialogue with each other (Senge 1990). Some respondents even believed that they did not gain any direct benefits from the collaboration exercise they participated in.

Nonetheless, the respondents emphasized the value of being able to make mistakes and then also having the opportunity to repeat an element to correct any errors. This meant that different approaches could be tested and compared, something that could result in new patterns of thought, that is, development and change (Gredler 1992). The exercises, however, mainly consisted of repetitive actions. The emergency personnel avoided mingling with the participants from the other organizations. When the scenario became complex, the personnel avoided collaboration and isolated themselves by being with their own colleagues, and repeated simple steps that they were already familiar with. The actions were path-dependent and conventional (Rutherford 1984).

The respondents indicated, however, an emerging path narrowing. The options for change, as expressed by the participants, were rejected, indicating limited room for maneuvers (Van Nieuwaal 2006). Such narrowing processes often end up being frustrating and eventually change behaviors (Van den Ven and Poole 1995; Garud and Karnøe 2001). Consequently, critique from the participants can contribute to change, introducing new and more organic ways to perform collaboration exercises (Carlström 2012). The concept of deinstitutionalization preceding something new, presented by Hinings and Malhotra (2008), can be useful in order to identify the change process of conservative organizations characterized by long traditions and stability.

During the interviews, none of the respondents focused on the exercise that was practiced. This suggests that the scenario is secondary to collaboration skills. Even if the techniques and approaches were different at different events, it seemed that the ability to collaborate was central to those participating in the exercise. It was about practicing collaboration techniques, structures, and communication that could easily be applied to all kinds of events. This suggests that collaboration exercises, regardless of the specific scenario, can be designed so that they are beneficial for all types of crises, provided that they focus on overlap and the ability to use common resources optimally.

One purpose of complex scenarios is to achieve collaboration by forcing participants to seek help from each other. However, the complexity of the exercises had the opposite effect and helped to create uncertainty. The staff isolated themselves and solved tasks together with the colleagues from their own organization. Since institutional learning is cultural and based on common experiences, norms, and beliefs, isolation can prevent learning (Fiol and Lyles 1985). The complexity tended to reduce the cross-boundary collaboration between the participants.

The interviews show that the exercises need to be structured and that efforts should mainly be based on known routines, that is, applying the repetitive knowledge that every profession exercises regularly. Bergström et al. (2010) have shown that a lack of structure and the absence of routines, in favor of an exaggerated belief in prestigeless collaboration, lead to uncertainty. It was confirmed by interviews that participants in certain exercises became passive because of overambitious, unstructured, and messy exercises (Powley and Nissen 2012). Although the exercises need to have elements of improvisation and unexpected situations (Mendonça and Fiedrich 2006; Grote et al. 2009), they also need to allow for well-established structures. One way to achieve this is to make sure that the exercise has a clear purpose and a structure, as well as clearly defined roles for participants (Petrenj et al. 2011). This approach calls for the integration of change-willingness and stability. If the participating organizations can balance contrasting characteristics such as flexibility and firmness, then learning can be more than an individualistic and repetitive behavior (drill). New integrative strategies can be developed and implemented (collaboration exercises) (Johansson et al. 2013; Alharbi et al. 2014).

Thus, an exercise can ideally be designed as a collaboration exercise when it is applicable to different situations and provides the individual with relevant challenges. It should also allow some space for participants to synchronize their work with those from the other organizations. The essence of a collaboration exercise, as opposed to strategic exercises and drills, is to help strengthen an organization's cross-boundary behavior (Moynihan 2009).

Allowing those who are practicing to test different approaches to deal with an event, and then to evaluate the effects can, in the next stage, allow for a new approach to be tested, which supports successive method development. With such a model, institutional learning can be developed as an operational approach. It may result in new ways of thinking. Under such circumstances, the exercise would be a way to identify weaknesses and try alternative ways to address actual events.

The data in t his study comes only from Sweden. To confirm the results of the study and its application in other countries, similar studies need to be done. The study is also limited in that only collaboration exercises were studied. Experiences from other forms of exercises with other aims can only partly be applied to this study. A further limitation is that learning as a benefit of collaboration exercises is based on the respondents' expressed perceptions. Further research that measures learning and benefits of collaboration exercises are needed to confirm the study's results.

6 Conclusion

By focusing on the collaboration elements during exercises, that is: (1) encourage synchronous collaboration, (2) test alternative strategies, (3) be able to make mistakes, (4) encourage comparisons, and (5) have joint evaluations, vulnerability can be reduced and preparedness to handle events that require advanced collaboration can be strengthened. This applies regardless of the scenario's characteristics, as the ability to collaborate is also applicable to other situations.

The study's findings can inspire exercise leaders to create cross-boundary exercises that have more focus on the common task. However, there is need to examine the effects of such exercises in future studies. This could be accomplished by creating shorter exercises with more synchronous collaboration elements than were observed in these exercises.

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